

**CLEANING PAD FOR SINGLE OR MULTI-DISK CLEANING MACHINES**

[0001] The present invention pertains to cleaning pads according to the introductory clause of the main claim.

[0002] Cleaning pads for single or multi-disk cleaning machines are installed on the side of the cleaning machine's drive plate which faces the material to be cleaned and are thus made to rotate to clean or to polish the material to be cleaned. Cleaning pads of this type are described in, for example, DE 44 17 535 A1 and in DE 195 45 242 A1. They consist of a textile pad, which is attached by a fastening element to the drive plate. When heavily soiled textile floor coverings such as carpets are being cleaned, the cleaning action of these textile pads is often inadequate. They also suffer from the disadvantage that they must be cleaned frequently in order to maintain their ability to clean. They also wear down relatively quickly and must therefore be replaced frequently.

[0003] The task of the present invention is to create cleaning pads with a cleaning action which is significantly improved over that of conventional cleaning pads but which can be attached to the conventional drive plates without modification to the cleaning machines and which also experience less wear and therefore do not have to be replaced as often. The cleaning pads are also to be easy to clean once the cleaning work has been completed.

[0004] This task is accomplished according to the invention by a cleaning pad of the general type indicated above with the features of the characterizing clause of the main claim. The subclaims specify preferred embodiments of the invention.

[0005] It is provided according to the invention that areas of different types of loop fabric are provided on the work surface, that is, on the side of the cleaning pad which faces the surface to be cleaned. For example, terry structures, velour structures, cut and uncut loop structures (Berber-like structures), and completely uncut loop structures (Berber-like structures) are used, as a result of which different surface areas with different cleaning and polishing effects can be obtained. By arranging these different areas on the cleaning pad one after the other in the cleaning direction, it is possible to provide dirt-loosening, dirt-absorbing, and dirt-transporting sections on the cleaning pad with the result that an effective and long-lasting cleaning action is achieved.

[0006] On the surface of the working pad facing away from the surface to be cleaned, an absorbent layer is provided, which can consist, for example, of nonwoven fabric, of needle-punched nonwoven fabric, of cotton terry cloth, or of cotton fabric. The absorbent layer is followed by a regenerative core, such as a layer of natural or artificial sponge or cotton wadding. This is followed by another absorbent layer and finally by a cover layer, which consists of a dimensionally stable material. Fastening elements are attached to this cover layer, which make it possible to attach the cleaning pad to the cleaning machine.

[0007] The surprising observation was made that the cleaning performance of a structure of this type with a total of five layers consisting of a working surface, nonwovens, and sponges was much better than that of conventional cleaning pads.

Wear was also significantly reduced, and the cleaning pad could be cleaned easily by washing it out with water.

[0008]        Instead of the preferred construction of the cleaning pad with five layers, it is also possible to use a four-layer design, in which the absorbent layer between the regenerative core and the cover layer is omitted. This arrangement can still provide usable results in cases where the requirements on the cleaning action and washability of the dirty cleaning pad are not as high.

[0009]        The working surface can consist of various materials, e.g., loop material, and be provided with diamond patterns, Berber-like structures, cut Berber-like structures, microloops, velours, and knit or warp knit fabric. Brushes can also be incorporated into the working surface. The working surface is preferably divided into separate areas with different structures, which has the effect improving the cleaning action. Needle-punched nonwovens are preferred. They can be designed as loop material, including material with cut loops (velours). The fibers can be synthetic fibers made of polyamide, polyester, viscose, polypropylene, or nylon; or they can be natural fibers of wool or cotton; or they can be blends of the fibers just mentioned. The edges of the textile pads can be bound off or connected in some other way to the adjacent layers.

[0010]        The sponge pads can consist of natural materials such as natural sponge or synthetic materials such as artificial sponge.

[0011] The titers of the individual fibers of the textile pads are preferably in the range of approximately 10-200 denier. The individual layers of the textile pads have a mass per unit area in the range between 100 and 2,000 g/m<sup>3</sup>.

[0012] The individual layers of the cleaning pad can be joined together by conventional joining techniques. Preferably they are sewn together by stitched seams, which can be arranged either radially or concentrically. A combination of radial and concentric seams is also possible.

[0013] The cleaning pads are preferably used in the form of round pads. For special purposes, however, other shapes are also possible, such as oval pads for special machines for the cleaning of floors and walls or rectangular or square pads for mop holders or special-purpose machines.

[0014] Because of their special layered structure, the cleaning pads according to the invention are easy to clean. For this purpose, they are placed in a self-cleaning solution and then freed of the dirt particles in a mop press, in a spinner, or in a mangle or roller press.

[0015] Thorough washing is required only after several months of use.

[0016] The inventive cleaning pads last much longer than conventional synthetic cleaning pads, which must be replaced after cleaning cycles of approximately 10-30 m<sup>2</sup>.

[0017] The cleaning pads according to the invention are suitable for the cleaning, polishing, and scouring, of textile floor coverings, carpeting, and floors, including hard floors and other solid surfaces.

[0018] With the inventive cleaning pads, even large floor areas can be processed with only two cleaning pads in conjunction with a standard commercial wheeled bucket and its wringer. The pads are used either wet or damp, one replacing the other in alternation, because, in contrast to conventional cleaning pads, they can be freed of the dirt they have accumulated and then wrung out in the bucket on an alternating basis right at the work site during the course of the cleaning work itself.

[0019] Because of the multilayer structure of the cleaning pads and the absorptive power of the regenerative core in the presence of water, the ability of the pads to hold dirt is much greater, and yet the floor covering is cleaned much more thoroughly.

[0020] The layer materials used are permeable to dirt and water. The rotation produced by the cleaning machine generates heat and also creates a certain degree of vacuum, which promotes the displacement of the moisture.

[0021] The invention is explained below by way of example on the basis of a description of the figures:

[0022] Figure 1 shows a cleaning pad with a layered structure consisting of five layers;

[0023] Figure 2 shows a cleaning pad with a layered structure consisting of four layers; and

[0024] Figure 3 shows a plan view of the cleaning pad according to Figure 1.

[0025] The five-layer cleaning pad of Figure 1 comprises a textile pad 12 of coarsely needle-punched nonwoven as the bottom layer, that is, the layer which faces

the material to be cleaned. In the direction proceeding toward the drive plate of the cleaning machine, the bottom layer is followed first by an absorbent layer 13, which can consist of nonwoven, of needle-punched nonwoven, of terry cloth, or of wool or cotton fabric. This absorbent layer serves as a retaining reservoir for the moisture required for cleaning. Attached to the absorbent layer is a regenerative core, which can consist of natural or artificial sponge or of cotton wadding. The regenerative core 14 accepts the dirt removed from the working layer and can be regenerated by washing it out. Following the regenerative core layer 14 is a second absorbent layer 15, the top surface of which is covered by a cover layer 16. The cover layer 16 consists of a dimensionally stable material and serves as a carrier for the cleaning pad; it also accepts a fastening element 30, which serves to attach the cleaning pad 10 to the cleaning machine.

[0026] It is also possible for the second absorbent layer to be made of dimensionally stable material. In this case, there is no need to add a separate cover layer, which means that this cleaning pad has only four layers. An arrangement of this type is shown in Figure 2. The reference numbers used in Figure 2 for the individual layers are the same as those in Figure 1.

[0027] Figure 3 shows a plan view of the cleaning pad. The stitched seams 32, by means of which the individual layers are sewn together, are arranged both concentrically and radially, as a result of which the working surfaces 12 are divided into individual segments, which can be designed differently with respect to their surface texture.